

## CLAIMS

### What is claimed:

- 1 ~~1. A method for copying the contents of a first virtual disk defined by a~~  
2 ~~first table having one or more entries that associate original segments of~~  
3 ~~the virtual disk with location in one or more storage containers, the~~  
4 ~~method comprising the step of copying the entries of the first table to a~~  
5 ~~second table to create a second virtual disk.~~
- 1 2. The method of claim 1, further comprising the step of modifying the  
2 first table to prevent write operations to the first virtual disk.
- 1 3. The method of claim 2, wherein the step of modifying the first table  
2 comprises activation of a Nw state.
- 1 4. The method of claim 2, wherein the step of modifying the first table  
2 comprises activation of an invalid state.
- 1 5. The method of claim 1, further comprising the step of delaying  
2 input/output (I/O) operations to the first or second virtual disk.
- 1 6. The method of claim 5 wherein in the step of delaying I/O  
2 operations comprises delaying I/O operation for a prespecified time period.
- 1 7. The method of claim 5 further comprising the step of canceling the  
2 delay of I/O operations.
- 1 8. The method of claim 1 further comprising the steps of:  
2 receiving a write operation to one of the original segments;  
3 creating a new segment;  
4 copying the contents at the original segment to the new segment;  
5 and  
6 completing the write operation to the new segment.

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1 9. The method of claim 8, wherein a controller stores a first copy of the  
2 first table, an agent stores a second copy of the first table, and the step of  
3 creating a new segment further comprises creating a new segment in the  
4 first copy and transferring data from the first copy to the second copy so  
5 that the new segment is created in the second copy.

1 10. The method of claim 1 further comprising the steps of:  
2 receiving a write operation to one of the original segments;  
3 creating a new segment;  
4 copying the contents at the original segment to the new segment;  
5 and  
6 completing the write operation to the original segment.

1 11. The method of claim 10, wherein a controller stores a first copy of  
2 the first table, an agent stores a second copy of the first table, and the step  
3 of creating a new segment further comprises creating a new segment in  
4 the first copy and transferring data from the first copy to the second copy  
5 so that the new segment is created in the second copy.

1 12. A method for mapping a virtual disk segment to a storage location  
2 within a storage device, said method comprising the steps of:  
3 allocating a new segment of storage space;  
4 copying an existing virtual segment of data into said storage space;  
5 updating at least one mapping table corresponding to the existing  
6 virtual segment of data, said table having an entry corresponding to the  
7 new segment of storage space; and  
8 store the table in memory.

1 13. The system of claim 12, wherein the memory is volatile.

1 14. The system of claim 12, wherein said storage location comprises a  
2 block of data within the storage device.

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1 15. The system of claim 14, wherein the segment of data is about 1 MB.

1 16. The system of claim 12, wherein the memory resides on an agent  
2 coupled to the host.

1 17. A method for maintaining a table for mapping virtual disk blocks to  
2 storage locations on storage devices within a network, comprising:  
3 receiving a command from a controller at an agent storing the table;  
4 activating states within entries of the table;  
5 completing operations at the table; and  
6 updating the table in response to the command.

1 18. The method of claim 17, further comprising setting a blocking flag  
2 until operations are completed.

1 19. The method of claim 17, further comprising obtaining mapping  
2 information from one of the entries in the table.

1 20. A computer program product comprising a computer useable  
2 medium having computer readable code embodied therein for maintaining  
3 a table for mapping virtual disk blocks to storage locations on storage  
4 devices within a network, the computer program product adapted when  
5 run on a computer to effect steps including:  
6 specifying a block on the virtual disk within the operation;  
7 accessing a table mapping the block to a storage location on a  
8 storage device;  
9 copying a corresponding virtual segment of data to the storage  
10 device; and  
11 updating the corresponding mapping agents.